

STIC-ILL

SB 1. H6

From: Hwu, June 7/661
S nt: Thursday, May 10, 2001 7:41 AM
To: STIC-ILL
Subject: Please order the following references.

L5 ANSWER 36 OF 36 BIOSIS COPYRIGHT 2001 BIOSIS
AN 1977:100506 BIOSIS
DN BR13:100506
TI ***INTERSPECIFIC*** ***HYBRIDIZATION*** AMONG CERTAIN INDONESIAN
AND INDIAN ***IMPATIENS*** -SPP.
AU ARISUMI T
SO HortScience, (1977) 12 (4 SECT 2), 410.
CODEN: HJHSAR. ISSN: 0018-5345.
DT Conference
FS BR; OLD
LA Unavail
09473386

5 ANSWER 33 OF 36 BIOSIS COPYRIGHT 2001 BIOSIS
AN 1984:162665 BIOSIS
DN BR27:79157
TI ***INTERSPECIFIC*** ***HYBRIDIZATION*** AMONG ***IMPATIENS***
AT VARYING PLOIDY LEVELS.
AU ARISUMI T
CS FLORIST AND NURSERY CROPS LABORATORY, UNITED STATES DEPARTMENT OF
AGRICULTURE, BELTSVILLE, MD. 20705.
SO 81ST ANNUAL MEETING OF THE AMERICAN SOCIETY FOR HORTICULTURAL SCIENCE AND
THE 29TH ANNUAL MEETING OF THE CANADIAN SOCIETY FOR HORTICULTURAL SCIENCE,
VANCOUVER, B.C., CANADA, AUG. 3-9, 1984. HORTSCIENCE. (1984) 19 (3 SECT
2), 547.
CODEN: HJHSAR. ISSN: 0018-5345.
DT Conference
FS BR; OLD
LA English
09473386

L5 ANSWER 30 OF 36 BIOSIS COPYRIGHT 2001 BIOSIS
AN 1990:534362 BIOSIS
DN BR39:134860
TI IMPROVEMENT OF NEW GUINEA ***IMPATIENS*** BY ***INTERSPECIFIC***
HYBRIDIZATION
AU STEPHENS L C; FRUTH R L
CS DEP. HORTIC., IOWA STATE UNIV., AMES, IA. 50011, USA.
SO 87TH ANNUAL MEETING OF THE AMERICAN SOCIETY FOR HORTICULTURAL SCIENCE,
TUCSON, ARIZONA, USA, NOVEMBER 4-8, 1990. HORTSCIENCE. (1990) 25 (9),
1177.
CODEN: HJHSAR. ISSN: 0018-5345.
DT Conference
FS BR; OLD
LA Englis
09473386

ANSWER 27 OF 36 BIOSIS COPYRIGHT 2001 BIOSIS
AN 1995:221020 BIOSIS
DN PREV199598235320
TI Variability in water loss patterns of New Guinea ***Impatiens***
cultivars and ***breeding*** selections.
AU Strefeler, Mark S.; Quene, Robert-Jan W.

- 9:00 Fall Foliage Coloration as an Objective for Genetic Improvement of a Utah Maple (*Acer grandidentatum* Nutt.) 242

Barker, Philip A., Intermountain Forest & Range Experiment Station, USDA Forest Service, Provo, Utah; and C. Frank Williams, College of Biological & Agricultural Sciences, Brigham Young University, Provo, Utah

Acer grandidentatum, called bigtooth, scrub, or canyon maple, is shrub-like on dry sites and a tree to 12 m with one to several trunks on more favorable sites. Pronounced fall foliage coloration as well as apparent tolerance of alkaline soils, drought, and hardness to at least -35°C make this little-known maple potentially desirable for landscape use in western North America and elsewhere. Analysis of wild stands of canyon maple in Utah from September through early October has indicated consistent, year after year, differences between individuals in their order and degree of foliage coloration. Achieving genetic gains in this phenotypic trait is an objective of first generation selection from wild stands and of progeny testing—the evaluation of some of the selections as desirable seed sources on the basis of progeny performance. Techniques used in measuring fall foliage coloration are described.

- 9:15 Flavonoid Chemical Markers as an Adjunct to the Identification of Cultivars 243

Asen, S., U.S. Department of Agriculture, Agricultural Research Service, Beltsville, Maryland

A high pressure liquid chromatographic procedure for the separation and quantitation of naturally occurring flavonoids has been developed. The technique offers short analysis time, use of extremely small amounts of tissue, high resolution, no derivatization or risk of thermal decomposition, easy quantitation, and is superior to existing classical chromatographic procedures. The use of flavonoid adsorption profiles, obtained by this technique, is an important adjunct to the descriptive morphological and physiological methods presently used to identify plant cultivars for the existing Plant Patent law.

- 9:30 Interspecific Hybridization Among Certain Indonesian and Indian Impatiens Spp. L. 244

Arizumi, T., Plant Genetics and Germplasm Institute, USDA Agricultural Research Center-West, Beltsville, Md.

I. balsamina L. (India), *I. campanulata* Wight (India), *I. flaccida* Arnott (India), *I. hookeriana* Arnott (Sri Lanka), *I. platypetala* Lindl. (Java), *I. platypetala* Lindl. (Borneo), and P.I. 366031 (an unidentified species from Malaya) were crossed in all possible ways to identify potential bridge species between the Indian and New Guinea species. With 2 exceptions all crosses failed to set seed. *I. platypetala* (Borneo) crossed readily with *I. flaccida* forming fertile F₁ seedlings. F₂ seedlings segregated for various parental phenotypes. A tetraploid form of *I. platypetala* (Java) crossed with P.I. 366031 to produce several semi-sterile seedlings.

- 9:45 Culture of Abortive Embryos *in vitro* 245

Arizumi, T., Plant Genetics and Germplasm Institute, USDA Agricultural Research Center-West, Beltsville, Md.

Abortive embryos of *I. hookeriana* Arnott (Sri Lanka) x *I. campanulata* Wight (India) were cultured *in vitro* using Murashige-Skoog and Nitsch media at 26.7°C, 12 hr light/ 23.9°C, 12 hr dark, and 21.1°C, 12 hr light/ 18.3°C, 12 hr dark. Cultures were illuminated with 400-600 lux under cool, white, fluorescent lights. Embryos 15 days or younger did not survive. About 10% of the 15-20 day old embryos turned green but did not develop further. Embryos excised after 20 days showed a wide range of differences in size and development. About 25% of these developed true leaves and roots after 2 months in culture. The rest died in culture after partial greening and development. The higher temperature promoted growth and development but did not affect survival rates. Seed harvested at maturity were non-viable *in vitro* and in conventional germination media.

(40) POMOLOGY —
REST AND DORMANCY
Room 1 Bonneville Hall

Presiding: M. N. Westwood, Oregon State University, Corvallis

- 8:00 Comparing Sprinkling with Heating for Frost Protection 248

Martsoff, J. O., C. T. Morrow, K. B. Perry, and A. R. Jarrett, The Pennsylvania State University, University Park

The equipping of a 0.33 Ha apple block at Rock Springs Agricultural Research Center (Gallia Beauty, Golden Del., Goldspur Del., Topred Del., and Redspur Del. on each of seedling, MM 104, MM 106, and MM 111 rootstocks) with individual sprinklers over each tree (Olson 8400 set 3m x 3.5m) has provided an opportunity to compare sprinkling with heating for frost protection. The system is designed to facilitate adjusting the application rate to match the need determined largely by monitored atmospheric conditions. Application variation is accomplished by either regulating the pressure over a 10-fold range (34.5 kPa to 345 kPa; gravity feed from catchment pond above the orchard elevation) or pulsing the system on and off through electronically actuated valves or both. A twin block (0.33 Ha) serves as a non-treated check. Subsequently this sister block may be used to test bloom delay methodology emphasizing a similar variable rate sprinkling system matching the application rate to the atmospheric evaporative power. Experiences are to be compared with those gained through the firing of a 1 Ha Golden Del./MM104 block equipped with both 112 Auto Clean Stack and 112 Large Cone heaters supplied and regulated by pipeline.

- 8:15 Effects of Prebloom Overhead Sprinkling on Apple Bud Hardiness, Bud Set and Fruit Quality 247

Pisani, P. L., and J. L. Anderson,* Instituto Coltivazioni Arboree — University of Padova, Italy and Utah State University, Logan

Blossoming of 'Rome' apples was delayed two weeks by evaporative cooling from overhead sprinkling. Hardiness of fruit buds from sprinkled and nonsprinkled trees was determined periodically during bud development in the spring of 1977. 750 temperatures of sprinkled buds were up to 8°C lower than those of nonsprinkled buds on a given sampling date. Sprinkled buds of a comparable stage of development (but later sampling date) were comparable to nonsprinkled buds in hardiness. Relative bud set of sprinkled and nonsprinkled 'Rome' apples was determined. Fruit russetting of 'Golden Delicious' apples sprinkled for bloom delay in Italy during the Spring of 1976 was less than that from nonsprinkled trees.

- 8:30 The Effect of Evaporative Cooling for Bloom Delay on 'Bartlett' and 'Bosc' pear Tree Performance (A Discussion Paper) 248

Lombard, P. B., M. D. Collins and J. W. Wolfe, Oregon State University, Southern Oregon Experiment Station, Medford

Two mist systems, one in a mature pear orchard and the other in a young pear hedgerow, delayed bloom 15 days for 'Bartlett' and 8 days for 'Bosc' while a low pressure sprinkler system delayed bloom 14 and 8 days for 'Bartlett' and 'Bosc'. Bloom delay generally increased fruit set and seed content of the fruit. Return bloom was greatly reduced on several of the delayed bloom plots and subsequently the crop was reduced the following year. Yield was decreased in most treated plots. Fruit growth rates were accelerated in the bloom-delayed trees, but fruit volume at harvest was reduced 6% for 'Bartlett' and 12% for 'Bosc', while harvest maturity as indicated by fruit pressure was delayed 0 to 6 days for 'Bartlett' and 2 to 7 days for 'Bosc'. The effect of fruit size and maturity was greater on 'Bosc' than on 'Bartlett'. Bloom delay had a greater effect on reducing fruit size at harvest than delaying harvest maturity. Leaf N levels were reduced in all delayed plots. Pear psylla activity was reduced during the misting. Fire blight was found in the misted 'Bosc' and in the sprinkled plots of both cultivars for one year only.

- 8:45 Field Testing the Utah Chill Unit and Growing Degree Hour Models Using Low Chilling Peaches 249

Powell, Arlie A., University of Georgia, Cooperative Extension Service, Tifton

Temperatures during the rest and postrest periods were obtained using a continuously recording thermograph in the winters of 1975-76 and 1976-77. Bud development data were collected from 3 low chilling peach cultivars, 'June Gold', 'Spring-brite', and 'Maygold' at weekly intervals during late winter. Phenological development was studied in relation to growing degree hours above 40°F. An estimate was made of chill units required to satisfy rest of varieties and of the growing degree hour requirement to 50% bloom. Findings were similar during the two seasons studied. Chill units required ranged from 540 to 600, and growing degree hours needed were 9,200 to 10,000.

STIC-ILL

SB 1. H6

From: Hwu, June 1661
Sent: Thursday, May 10, 2001 7:41 AM
To: STIC-ILL
Subject: Please order the following references.

L5 ANSWER 36 OF 36 BIOSIS COPYRIGHT 2001 BIOSIS
AN 1977:100506 BIOSIS
DN BR13:100506
TI ***INTERSPECIFIC*** ***HYBRIDIZATION*** AMONG CERTAIN INDONESIAN
AND INDIAN ***IMPATIENS*** -SPP.
AU ARISUMI T
SO HortScience, (1977) 12 (4 SECT 2), 410.
CODEN: HJHSAR. ISSN: 0018-5345.
DT Conference
FS BR; OLD
LA Unavail
09473386

5 ANSWER 33 OF 36 BIOSIS COPYRIGHT 2001 BIOSIS
AN 1984:162665 BIOSIS
DN BR27:79157
TI ***INTERSPECIFIC*** ***HYBRIDIZATION*** AMONG ***IMPATIENS***
AT VARYING PLOIDY LEVELS.
AU ARISUMI T
CS FLORIST AND NURSERY CROPS LABORATORY, UNITED STATES DEPARTMENT OF
AGRICULTURE, BELTSVILLE, MD. 20705.
SO 81ST ANNUAL MEETING OF THE AMERICAN SOCIETY FOR HORTICULTURAL SCIENCE AND
THE 29TH ANNUAL MEETING OF THE CANADIAN SOCIETY FOR HORTICULTURAL SCIENCE,
VANCOUVER, B.C., CANADA, AUG. 3-9, 1984. HORTSCIENCE. (1984) 19 (3 SECT
2), 547.
CODEN: HJHSAR. ISSN: 0018-5345.
DT Conference
FS BR; OLD
LA English
09473386

L5 ANSWER 30 OF 36 BIOSIS COPYRIGHT 2001 BIOSIS
AN 1990:534362 BIOSIS
DN BR39:134860
TI IMPROVEMENT OF NEW GUINEA ***IMPATIENS*** BY ***INTERSPECIFIC***
HYBRIDIZATION
AU STEPHENS L C; FRUTH R L
CS DEP. HORTIC., IOWA STATE UNIV., AMES, IA. 50011, USA.
SO 87TH ANNUAL MEETING OF THE AMERICAN SOCIETY FOR HORTICULTURAL SCIENCE,
TUCSON, ARIZONA, USA, NOVEMBER 4-8, 1990. HORTSCIENCE. (1990) 25 (9),
1177.
CODEN: HJHSAR. ISSN: 0018-5345.
DT Conference
FS BR; OLD
LA Englis
09473386

ANSWER 27 OF 36 BIOSIS COPYRIGHT 2001 BIOSIS
AN 1995:221020 BIOSIS
DN PREV199598235320
TI Variability in water loss patterns of New Guinea ***Impatiens***
cultivars and ***breeding*** selections.
AU Strefeler, Mark S.; Quene, Robert-Jan W.

contains five species (*S. opuntioides*, *S. obtusiloba*, *S. orssichiana*, *S. russelliana*, and *S. truncata*). There is considerable potential for the improvement of commercial cultivars in both genera. Flower color and form, plant habit, postharvest performance, and the responsiveness to floral induction treatments are selection criteria used in breeding of *Rhipsalidopsis*. The selection criteria used in breeding of *Schlumbergera* are flower color and form, growth rate, phylloclade size and shape, plant habit, and the critical daylength for flowering. Inbreeding depression, self-incompatibility, and a long generation time (1.5 to 3 years) are impediments to breeding in both genera. Interspecific hybridization has been performed in *Rhipsalidopsis* and *Schlumbergera*, and significant phenotypic variation has been observed within interspecific hybrid populations.

794 IMPROVEMENT OF NEW GUINEA *IMPATIENS* BY INTERSPECIFIC HYBRIDIZATION

Loren C. Stephens* and Robin L. Fruth, Department of Horticulture, Iowa State University, Ames, IA 50011

New Guinea *Impatiens* cultivars, *I. hawkeri* Bull., are susceptible to hot, windy conditions throughout much of the Midwest and Western U.S. Certain Indonesian *Impatiens* from Java (*I. platyostala* Lindl.) and Celebes (*I. aurantiaca* Teysm.) are much more heat-tolerant. Interspecific hybrids involving Java and Celebes *Impatiens* with the New Guinea species have been produced, but lack of fertility has been a persistent problem, unless amphidiploids are produced. Because selection is difficult in amphidiploid populations, other methods of recovering fertility have been investigated. Some interspecific hybrid fertility has been obtained from crossing *Impatiens* 'Tange glow' with a Java x New Guinea hybrid. Evidence will be presented on the role of the Celebes genome in female fertility, and the role of unreduced pollen in the Java x New Guinea hybrid. Approaches to understanding and overcoming sterility in *Impatiens* interspecific hybrids will be discussed.

795 LILACS AND OTHER WOODY ORNAMENTALS FOR ALL SEASONS

Owen M. Rogers*, Plant Biology Department, University of New Hampshire, Durham, NH 03824

Current lilac breeding programs at the University of New Hampshire focus on the later (June) blooming species of *Syringa* with goals of extending the season of bloom selecting slower growing forms and developing lines with double flowers. Progress toward these goals and others, e.g., true dwarfs, will be discussed and illustrated.

Every university in the northeast includes woody ornamentals in its program to some degree. The University of New Hampshire is an official test site for ornamentals from NE-9 and NC-7 germplasm programs and the National Arboretum's new introduction program. The value of these programs and their future direction will be discussed.

796 GENETICS AND BIOCHEMISTRY OF INSECT AND MITE RESISTANCE IN GERANIUM

Richard Craig*, Richard A. Grazzini* and R.O. Mumma, Departments of Horticulture and Entomology, Penn State University, University Park, PA 16802

Resistance to mites and small insects in geranium results from the production of a viscous exudate on tall glandular trichomes present on the plant surface. This exudate exhibits sticky-trap properties immobilizing pests and reducing feeding and fecundity. The exudate is composed of long-chain 6-alkyl salicylic acids known as anacardic acids. The exudate of resistant plants contains 86% unsaturated anacardic acids. Susceptible genotypes possess fewer tall glandular trichomes and a trichome exudate which is dry and ineffective in trapping pests. The exudate from susceptible plants contains 70% saturated anacardic acids, thus explaining the physical state of the exudate. A single dominant locus controls the production of predominantly unsaturated versus saturated anacardic acids and thus resistance versus susceptibility. Other loci condition the ratio of C22:C24 unsaturated anacardic acids and the density of tall glandular trichomes. Current research involves the elucidation of the enzymatic pathway(s) involved in anacardic acid biosynthesis, identification of the regulatory enzymes and isolation of the mRNA transcripts associated with pertinent genes.

80 WORKSHOP 9 (Abstr. 797-798)

797 GENETIC MANIPULATION OF TREE FRUIT ARCHITECTURE

Ralph Scorza, USDA-ARS-AFRS, Kearneysville, WV 25430

The genetically available range in tree fruit architecture has not been fully utilized for tree fruit breeding or production. Higher planting densities, new training systems, high costs of pruning, the need to eliminate ladders in the orchard, and mechanized harvesting require a re-evaluation of tree architecture. Dwarf, semidwarf, columnar, and spur-type trees may be more efficient than standard tree forms, especially when combined with specific production systems. Studies of the growth of novel tree types and elucidation of the inheritance of growth habit components may allow breeders to combine canopy growth characteristics to produce trees tailored to evolving production systems.

369 (PS VII)

ROOTSTOCK INFLUENCE ON FRUIT TREE ARCHITECTURE

James N. Cummins, Dept. of Horticultural Sciences, N. Y. State Agricultural Experiment Station, Cornell University, Geneva, NY 14456.

Rootstock influence on tree architecture may be seen in a variety of expressions. Aboveground effects include canopy volume and shape, crotch angles, branch display angles, relative distribution of long shoots and spurs, internode length, relative distribution of fruit buds and spurs, and trunk taper. Below the graft union, effects include relative distribution of fine vs. coarse roots, total root mass, and numbers, nature and distribution of burrknots. Many of these phenomena are indirect effects that stem from induction of fruiting by the rootstock, e.g., early fruit production induced by the rootstock will result in reduced canopy volume, reduced aboveground total mass, flatter branch display angles, and reduced root mass. The rootstock also plays a major role in the duration of shoot extension growth; by influencing the production of growth regulators in the shoot tip, the rootstock indirectly influences the inhibition of lateral buds and therefore the production of feathers.

798

SMALL FRUIT ARCHITECTURE

Adam Dale, Horticultural Research Institute of Ontario, Box 587, Simcoe, Ont. N3Y 4N5, Canada

Genetic variation in the architecture of berry crops will be reviewed. Examples will be given where changes in plant architecture have given increased yields, stabilized yields and improved fruit quality in strawberry, raspberry, highbush blueberry and currants.

Red raspberry will be emphasized as recent research on the architecture of the fruiting cane has enabled breeding strategies, based on plant architecture, to be developed.

89 WORKSHOP 10 (Abstr. 799-803)

799

BREEDING SWEETPOTATO FOR RESISTANCE TO MULTIPLE INSECT PESTS

Alfred Jones*, U.S. Vegetable Laboratory, ARS, USDA, 2875 Savannah Highway, Charleston, SC 29414.

Sweetpotato [*Ipomoea batatas* (L.) Lam.] cultivars with high levels of resistance to root damaging insects have been developed through the collaborative efforts of a multi-

13. Radford, P. J. 1967. Growth analysis formulae, their use and abuse. *Crop Sci.* 7:171-175.
14. Ronco, F. 1969. Assimilation chamber for measuring carbon dioxide exchange of tree seedlings in the laboratory. USDA Forest Service Res. Note Rm-143.
15. Ronsen, K. 1971. [Seed potatoes grown at different altitudes and

- different temperatures.] *Forskning Og i Landbruget* 22:241-66.
16. Went, F. W. 1957. The experimental control of plant growth. *Chronica Botanica*, Waltham. p. 109-13.
17. . 1959. Effects of environment of parent and grand-parent generations on tuber production by potatoes. *Amer. J. Bot.* 46:277-82.

J. Amer. Soc. Hort. Sci. 105(1):99-102. 1980.

Chromosome Numbers and Comparative Breeding Behavior of Certain *Impatiens* from Africa, India, and New Guinea¹

Toru Arisumi²

U.S. Department of Agriculture, Science and Education Administration, Agricultural Research, Beltsville, MD 20705

Additional index words. *Impatiens auricoma*, *I. epiphytica*, *I. marianae*, *I. campanulata*, *I. hookeriana*, *I. mooreana*

Abstract. Chromosome counts were made of 10 *Impatiens* spp. L. from Africa, 5 from India, and 6 from the New Guinea-Indonesia area. Chromosome numbers reported for the first time were $2x=16$ for *Impatiens auricoma* Baill., *I. epiphytica* G. M. Schulze, and *I. marianae* Reichb. Counts that differed from previous reports were $2x=18$ for *I. campanulata* Wight, $2x=36$ for *I. hookeriana* Arn., and $2x=32$ for *I. mooreana* Schltr. Breeding tests with 20 species showed that 6 were self-incompatible. Crosses between species from different geographic groups were incompatible. Four out of 72 possible crosses among 9 African species and 30 out of 30 among 6 New Guinea-Indonesia species were compatible. The 20 crosses among 5 Indian species were all incompatible. Aborted embryos were observed in 57 incompatible crosses.

Many species of *Impatiens* L. have been identified in the Old World, especially in tropical Africa and India (7, 8). Although some African and Indian species have been examined cytologically in biosystematic studies (6, 7, 8), little is known about their breeding behavior. Recently most breeding studies with this genus have been of the New Guinea *Impatiens*. Since the introduction of the New Guinea species into the U.S.A. less than 10 years ago (12), breeding studies have been conducted by commercial breeders, Longwood Gardens, the U.S. Department of Agriculture (1, 2, 4), and other research institutions (5, 9, 11).

This paper reports on the chromosome numbers and breeding behavior of certain *Impatiens* from Africa, India, and the New Guinea-Indonesia area. Specifically the objectives were: 1) to identify compatible and incompatible combinations among the species; and 2) to determine whether crossabilities among the species were related to chromosome numbers and/or geographic origins.

Materials and Methods

Parental species. The plants were obtained as rooted cuttings from stock plants in the Plant Introduction Station, U.S. Department of Agriculture, Glenn Dale, Md. Practically all of the species from Africa and India available at the station were used. Six species that were considered to be representative of the plant introductions from the New Guinea-Indonesia area morphologically and in breeding behavior were utilized (Table 1). The plant of *I. linearifolia* Warb. (Table 1) used in this study was a male-fertile sport (2) derived from a male-sterile plant introduction (1). Five to 10 plants of each of

these species were grown, selfed, and crossed under natural illumination in a screened greenhouse maintained at about 23.9°C (day)/18.3°C (night) from fall to late spring. Summer greenhouse temperatures were modified by heavy shading and evaporative pad-fan cooling. The plants were fertilized and sprayed with pesticides periodically and as required to maintain vigorous growth and health. New plants were propagated by cuttings to replace old plants.

Cytological methods. Root tips were treated with 0.2% aqueous colchicine before fixation in Carnoy's solution, and smears were prepared by standard acetocarmine procedures. Chromosome counts were made of figures in late prophase or metaphase under oil at $\times 980$.

Breeding methods. The plants were selfed or cross-pollinated whenever they came into bloom. Except for *I. balsamina* L. the species were pollinated several days after anthesis when the anther cap covering the pistils fell off to expose the stigma. *I. balsamina* had to be emasculated when the flower buds were tight to prevent self-pollination before anthesis (10). Initially 15-25 pollinations were made for each self or cross except those with *I. balsamina* seed parents. About 5-10 pollinations were made on *I. balsamina*.

Crosses and selfs that resulted in little or no fruit development and those that held their fruits less than 5 days were classified as incompatible and discontinued. Certain crosses and selfs that showed evidence of advanced embryo development before fruit abscission were repeated many times over several years to see if viable seeds could be recovered from large numbers of pollinations. Crosses and selfs that produced less than 10 viable seed per 100 pollinations were also classified as incompatible. Ovules of certain abscised capsules were dissected under a stereomicroscope at $\times 25$ magnification to observe aborted embryos.

Seed capsules of successful crosses and selfs were protected with glassine bags until harvest. The seeds were planted in soil soon after harvest, and kept under intermittent mist until germinated. Seedlings were transplanted individually into

¹Received for publication August 24, 1979.

The cost of publishing this paper was defrayed in part by the payment of page charges. Under postal regulations, this paper must therefore be hereby marked *advertisement* solely to indicate this fact.

²Research Plant Geneticist, Florist and Nursery Crops Laboratory, Horticultural Science Institute.

Table 1. Geographical origins and chromosome numbers of 21 *Impatiens* spp.

PI no.	Species	Origin	Somatic chromosome numbers	
			Present counts	Previous counts(reference)
380525	<i>I. auricoma</i> Baill.	Africa	16	
384998	<i>I. congolensis</i> G. M. Schulze & R. Wilczek	"	48	48(7)
404257	<i>I. epiphytica</i> G. M. Schulze	"	16	
383911	<i>I. marianae</i> Reichb.	"	"	
404262	<i>I. niamniamensis</i> Gilg.	"	32	32(7)
404265	<i>I. pseudoviola</i> Gilg.	"	16	16(7)
404271	<i>I. thomassetii</i> Hook.	"	"	
383872	<i>I. tuberifera</i> Humbert	"	"	
366034	<i>I. uguenensis</i> Warb.	"	"	16(7)
404276	<i>I. walleriana</i> Hook.	"	"	16(7)
404110	<i>I. balsamina</i> L.	India	14	14(7)
404255	<i>I. campanulata</i> Wight	"	18	20(7)
366028	<i>I. flaccida alba</i> Arn.	"	14	14(7)
404260	<i>I. hookeriana</i> Arn.	"	36	20(6), 40(7)
404266	<i>I. repens</i> Moon	"	14	14(7)
349584	<i>I. herzogii</i> K. Schum.	New Guinea	32	32(4)
354266	<i>I. linearifolia</i> Warb.	" "	32	32(1)
404261	<i>I. mooreana</i> Schltr.	" "	32	32(1), 66(7)
354253	<i>I. schlechteri</i> Warb.	" "	32	32(1, 7)
349629	<i>I. platypetala</i> Lindl.	Java	16	16(4, 5)
366029	Unidentified sp.	Celebes	8	8(2)

clay or plastic containers when they were 2 or 3 cm high. About 20-25 seedlings per progeny were grown to maturity. Hybridity was determined by inspection.

Results

Chromosome numbers. Chromosome numbers from present and previous counts are listed in Table 1. With some exceptions the present counts agreed with those reported previously. Chromosome numbers of *I. campanulata*, *I. hookeriana*, and *I. mooreana* with $2x=18$, 36, and 32, respectively, differed from previous counts (6, 7). Jones and Smith (7) found $2x=20$ for *I. campanulata*, $2x=40$ for *I. hookeriana*, and $6x=66$ for *I.*

mooreana. Bhaskar and Razi (6) reported $2x=20$ for *I. hookeriana* in the wild. Previous counts for the African spp. *I. auricoma*, *I. marianae*, and *I. tuberifera* were not found in the literature. All had $2x=16$.

Compatibility tests. Out of 20 species 6 were classified as self-incompatible (Table 2). *I. linearifolia* and *I. thomassetii* did not yield viable seed from about 200 pollinations each over 4 years. Self-pollinated fruits of these species abscised 3-5 days after pollination and seldom persisted beyond 1 week. The other self-incompatible species occasionally produced mature fruits with 1-5 nonviable seeds containing nearly full grown embryos. From about 200 self-pollinations each over 4 years, *I. epiphytica*, *I. pseudoviola*, and *I. campanulata*, respectively, yielded 2, 3, and 5 seedlings. In a 3-year period before 1978, *I. hookeriana* produced 20 mature but nonviable seeds from 300 self-pollinations, but in 1978 it produced 383 seeds from less than 100 pollinations. Of the 383 seeds sown in soil 9 germinated and developed 2-6 true leaves, but only 3 survived. All but *I. herzogii* and *I. repens* among the self-compatible species produced over 25 seedlings from less than 10 self pollinations. *I. herzogii* produced 20 seedlings from 50 selfs, and *I. repens* produced 6 seedlings from 30 selfs. *I. marianae* was not used for breeding because it produced only 2 flowers in 4 years.

Out of a total of 380 possible crosses attempted, 258 were between groups, 72 were within the African group, 20 within the Indian group, and 30 within the New Guinea-Indonesia group. Crosses between groups and within the Indian group were incompatible (Table 2). Four out of 72 crosses within the African species and 30 out of 30 within the New Guinea-Indonesia species were compatible (Table 2). With some exceptions the compatible crosses averaged 5-20 seed per capsule. In some crosses seed set differences were observed between reciprocals. *I. thomassetii* and *I. linearifolia* averaged less than 3 seed per capsule as seed parents and 2 or 3 times more as pollen parents.

Most seed capsules of incompatible crosses abscised within 4-7 days after pollination. About 28-35 days were required for

Table 2. Results of selfing and crossing 20 *Impatiens* spp.

Accession no.	Species	Self	List of cross-compatible spp.
A41	<i>I. auricoma</i>	compatible	none
A42	<i>I. congolensis</i>	compatible	A55
A50	<i>I. epiphytica</i>	incompatible	none
A55	<i>I. niamniamensis</i>	compatible	A42
A58	<i>I. pseudoviola</i>	incompatible	none
A64	<i>I. thomassetii</i>	incompatible	A69
A49	<i>I. tuberifera</i>	compatible	none
A31	<i>I. uguenensis</i>	compatible	none
A69	<i>I. walleriana</i>	compatible	A64
I47	<i>I. balsamina</i>	compatible	none
I48	<i>I. campanulata</i>	incompatible	none
I52	<i>I. flaccida alba</i>	compatible	none
I40	<i>I. hookeriana</i>	incompatible	none
I59	<i>I. repens</i>	compatible	none
N17	<i>I. herzogii</i>	compatible	N19, N15, N16, J21, & C26
N19	<i>I. linearifolia</i>	incompatible	N17, N15, N16, J21, & C26
N15	<i>I. mooreana</i>	compatible	N19, N17, N16, J21, & C26
N16	<i>I. schlechteri</i>	compatible	N19, N17, N15, J21, & C26
J21	<i>I. platypetala</i>	compatible	N19, N17, N16, N15, & C26
C26	Unidentified sp.	compatible	N19, N17, N16, N15, & J21

Table 3. Fruit retention and embryo development in 57 incompatible crosses among *Impatiens*.

Crosses	No. days fruits were held	Embryo development	
		Avg. stage	Most advanced stage
<i>I. auricoma</i>		z	
× <i>I. congolensis</i>	5-13	---	globular
× <i>I. flaccida alba</i>	5- 9	---	"
× <i>I. herzogii</i>	5-10	---	"
× <i>I. niamniensis</i>	5-12	---	"
× <i>I. repens</i>	5-12	---	"
× <i>I. thomassetii</i>	5- 7	---	"
× <i>I. tuberifera</i>	5- 9	---	"
× <i>I. uguensis</i>	5- 9	---	"
× <i>I. walleriana</i>	5- 9	---	"
<i>I. congolensis</i>			
× <i>I. auricoma</i>	5-17	---	torpedo
× <i>I. campanulata</i>	5- 7	---	globular
× <i>I. epiphytica</i>	5- 7	---	"
× <i>I. herzogii</i>	5-19	---	"
× <i>I. hookeriana</i>	5-19	---	"
<i>I. flaccida alba</i>			
× <i>I. auricoma</i>	5- 9	---	"
× <i>I. balsamina</i>	5-18	---	torpedo
× <i>I. campanulata</i>	5-20	---	"
× <i>I. congolensis</i>	5-11	---	globular
× C26	5-17	---	"
× <i>I. epiphytica</i>	5-18	globular	heart
× <i>I. herzogii</i>	5-17	"	torpedo
× <i>I. hookeriana</i>	5-16	---	globular
× <i>I. niamniensis</i>	5-15	---	"
× <i>I. pseudoviola</i>	5-11	---	"
× <i>I. repens</i>	5-18	globular	torpedo
× <i>I. tuberifera</i>	5-18	---	globular
× <i>I. uguensis</i>	5-17	globular	torpedo
× <i>I. walleriana</i>	5-10	---	globular
<i>I. hookeriana</i>			
× <i>I. balsamina</i>	5-12	---	"
× C26	5-15	---	"
× <i>I. campanulata</i>	12-28	heart	mature embryo
× <i>I. epiphytica</i>	5-12	---	globular
× <i>I. flaccida alba</i>	5-13	---	"
× <i>I. herzogii</i>	5-15	---	"
× <i>I. niamniensis</i>	5-19	---	"
× <i>I. pseudoviola</i>	5-10	---	"
× <i>I. repens</i>	5-10	---	"
× <i>I. thomassetii</i>	5-12	---	"
× <i>I. uguensis</i>	5-17	globular	torpedo
× <i>I. walleriana</i>	5-11	---	globular
<i>I. repens</i>			
× C26	5-10	---	"
× <i>I. epiphytica</i>	5-12	---	"
× <i>I. flaccida alba</i>	5-14	---	"
× <i>I. pseudoviola</i>	5-10	---	"
× <i>I. uguensis</i>	5-10	---	"
<i>I. uguensis</i>			
× <i>I. auricoma</i>	5-13	---	"
× <i>I. balsamina</i>	5-13	---	"
× <i>I. epiphytica</i>	5-16	globular	heart
× <i>I. flaccida alba</i>	5-18	"	"
× <i>I. herzogii</i>	5-10	"	"
× <i>I. hookeriana</i>	5-12	"	"
× <i>I. niamniensis</i>	5-12	---	globular
× <i>I. pseudoviola</i>	5- 8	---	"
× <i>I. repens</i>	5-14	---	"
× <i>I. thomassetii</i>	5-10	---	"
× <i>I. tuberifera</i>	5-10	---	"
× <i>I. walleriana</i>	5-16	globular	heart

^zNot visible under ×25 magnification.

seeds to mature. In some incompatible crosses fruit abscission was delayed 1-2 weeks beyond their reciprocals by certain

seed parents. In this respect *I. flaccida alba*, *I. hookeriana*, and *I. uguensis* were consistently superior as seed parents to the New Guinea-Indonesia species. No differences in fruit retention were observed between reciprocal crosses among the other species.

Incompatible crosses that held their seed capsules beyond 1 week are listed in Table 3. Of these only *I. hookeriana* × *I. campanulata* produced embryos large enough to be cultured *in vitro*. The others were more suited for ovule cultures. In those crosses the average embryo was not visible at ×25 magnification. About 50-90% of the ovules seemed to be alive at 7 days but deteriorated rapidly thereafter. Most were dead and discolored or shriveled when 9-14 days old, and only 2-10% of the aborted and healthy ovules contained embryos in the globular or more advanced developmental stages (Table 3).

Selfed progenies. In general selfed seedlings resembled their parents. Most selfed progenies had a few to several seedlings that were chlorotic and/or slow growing. Some had small to moderate numbers of albinos.

Hybrid progenies. Hybrid seedlings among the 4 New Guinea species, except for progenies of *I. linearifolia*, had blended characteristics of both parents. Relatively small numbers of *I. linearifolia* seedlings showed the variegated foliage of this species. Most hybrids were fertile as pollen and seed parents. As expected from previous studies (2, 4), hybrids among New Guinea × Celebes or Java species and Celebes × Java species were sterile. Some fertile hybrids from similar crosses have been observed by Weigle and Pasutti (11).

Seedlings of *I. congolensis* × *I. niamniensis* and its reciprocal were identical in most characteristics. A few weak seedlings died before maturity. In mature plant form, leaves, flowers and bloom habit, the hybrids showed blended characteristics of both parents. They were self- and cross-sterile.

Most seedlings of *I. walleriana* × *I. thomassetii* and its reciprocal had blended features of both parents in flower color, growth habit, and leaves. Few showed greater resemblance to one or the other parent. All bloomed for long periods or were everblooming like *I. walleriana*. *I. thomassetii* bloomed twice a year and only for short periods lasting 1 or 2 months. The hybrids were self-incompatible like *I. thomassetii*, cross-incompatible in reciprocal crosses with *I. thomassetii*, but compatible with *I. walleriana*.

Discussion

Considerable variation in basic chromosome numbers have been reported for *Impatiens*, e.g., $x=6$, 7, 8, and 10 (7, 8). Species from the New Guinea-Indonesia group examined thus far have $x=4$, 8, and 16 (1, 2). Natural polyploids have been found in the New Guinea-Indonesia group (1, 7), but some could have been diploidized over the years (4).

Limited data suggested that $x=8$ might be typical for the African species (7). At $x=8$, *I. niamniensis* and *I. congolensis* would be $4x$ and $6x$, respectively. These 2 polyploids were the only species that were morphologically similar in the African group.

According to Jones and Smith (7) species with $x=7$ are largely confined to India. There are also many species with $x=10$ in India (7). Variation in chromosome numbers within species with $x=10$ have resulted in $2x=18$ and 20 for *I. glandulifera* Royle and $2x=20$, 24, and 26 for *I. parvifolia* D. C. (7). The discrepancies in present and past counts for *I. campanulata* and *I. hookeriana* (Table 2) could be due to similar chromosomal variation within species.

From an evolutionary point of view, the African and Indian species used here are probably much older than the New Guinea-Indonesia species. They exhibit wide morphological differences and strong barriers to crossability between most species in each group. By comparison the New Guinea-Indonesia species have many similar morphological traits and cross easily among

themselves regardless of differences in basic chromosome numbers (1, 2, 4). An unidentified, wild species from Malaya (3) and 2 unidentified, wild species from Sumatra were recently hybridized with several polyploid New Guinea, Java, and Celebes species (unpublished data). These, together with the natural New Guinea tetraploid (1), were thought to be recently evolved polyploids that had not undergone diploidization.

Of 346 incompatible crosses, 57 (Table 3) were identified as having greater potential than the others for yielding seedlings through culture *in vitro*. The 57 crosses represented 49 hybrids, 29 between and 20 within groups. Since embryos aborted long before they were large enough to be manipulated for cultures in all but 1 of the incompatible crosses, the development of efficient ovule culture methods could play an important role in future breeding for interspecific hybrids.

Literature Cited

1. Arisumi, T. 1973. Chromosome numbers and interspecific hybrids among New Guinea *Impatiens* species. *J. Hered.* 64:77-79.
2. ———. 1974. Chromosome numbers and breeding behavior of hybrids among Celebes, Java, and New Guinea species of *Impatiens* L. *HortScience* 9:478-479.
3. ———. 1977. Interspecific hybridization among certain Indonesian and Indian *Impatiens* spp. L. *HortScience* 12:410. (Abstr.)
4. ———. 1978. Hybridization among diploid and tetraploid forms of New Guinea, Java, and Celebes *Impatiens* spp. *J. Amer. Soc. Hort. Sci.* 103:355-361.
5. Beck, A. R., J. L. Weigle, and E. W. Kruger. 1974. Breeding behavior and chromosome numbers among New Guinea and Java *Impatiens* species, cultivated varieties, and their interspecific hybrids. *Can. J. Bot.* 52:923-925.
6. Bhaskar, V. and B. A. Razi. 1972-73. Studies on South Indian Balsaminaceae: I. Chromosome numbers in some species of *Impatiens* Linn. *J. Mysore Univ. Sect. B.* 25:115-122.
7. Jones, K. and J. B. Smith. 1966. The cytogeography of *Impatiens* L. *Kew Bul.* 20:63-72.
8. Khoshoo, T. N. 1957. Cytology of some *Impatiens* species. *Caryologia* 10:55-75.
9. Pasutti, D. W., J. L. Weigle, and A. R. Beck. 1977. Cytology and breeding behavior of some *Impatiens* hybrids and backcross progeny. *Can. J. Bot.* 55:296-300.
10. Smith, F. H. 1938. Reduction divisions in triploid *impatiens*. *Amer. J. Bot.* 25:651-654.
11. Weigle, J. L. and D. W. Pasutti. 1976. Approaches to transfer of characteristics between ploidy levels in New Guinea *Impatiens*. *Acta Hort.* 63:109-112.
12. Winters, H. F. 1973. New *Impatiens* from New Guinea. *Amer. Hort.* 52(3):16-22.

J. Amer. Soc. Hort. Sci. 105(1):102-107. 1980.

Effect of Duration and Rate of Freezing and Tissue Hydration on 'Bartlett' Pear Buds, Flowers, and Small Fruit

John G. Strang², Porter B. Lombard³, M. N. Westwood, and C. J. Weiser⁴
Department of Horticulture, Oregon State University, Corvallis, OR 97331

Additional index words. *Pyrus communis*, frost

Abstract. Freezing studies on 'Bartlett' pear (*Pyrus communis* L.) bouquets of buds, flowers, and small fruit showed injury increased with decreasing temperature, increasing developmental stage, and increasing duration of frost. At the minimum temperature, 30 and 60 minutes of frost exposure in all stages increased injury, however, in the small fruit stage injury at -2°C increased for up to 2 hours exposure. The effect of freezing rate was dependent on minimum temperature and dry florets were injured slightly more than florets misted just prior to freezing.

Spring frosts frequently injure the flowers and small fruit of pears causing major production losses. In the past, critical temperature tables have been developed for pears based on floral developmental stages and critical temperatures (1, 10, 13, 21). A critical temperature is defined as the lowest temperature that can be endured by buds, flowers, or fruit for 30 minutes or less without injury, an interval derived from field observations (20). Field (5) found increasing floral injury up to 6 hr at -2.2 and -3.3°C and increasing injury for up to 12 hr at -1.7° in several apple cultivars during controlled freezing tests.

¹Received for publication March 20, 1979. Published with the approval of the director of the Oregon State University Experiment Station as Ore. Agr. Expt. Sta. Tech. Paper No. 5092. From a dissertation submitted by the senior author in partial fulfillment of the requirements for the Ph.D. degree at Oregon State University.

The cost of publishing this paper was defrayed in part by the payment of page charges. Under postal regulations this paper must therefore be hereby marked advertisement solely to indicate this fact.

²Department of Horticulture and Landscape Architecture, University of Kentucky, Lexington, KY 40546.

³Southern Oregon Experiment Station, 569 Hanley Road, Medford, OR 97502.

⁴The authors thank Nancy Strang, Cindy Hunt, and Frank Papen for their valuable technical assistance.

Initial studies concerning the effects of freezing rate on apple blossoms by Chandler (3) were inconclusive, while subsequent studies (5, 6) noted an increase in injury at rapid freezing rates. Moisture applied to the surface of apple flowers (12) and *Eucalyptus* leaves (7, 19) just prior to freezing increased the amount of injury. Hewett et al. (8) found a significant increase in injury when apple flowers were kept wet for 24 hr before freezing, but that there was little difference in injury between dry control flowers and flowers that had been wet just prior to freezing. Desiccation studies on apple flowers (6, 11) and fruit (3) indicate that dehydration increases hardness.

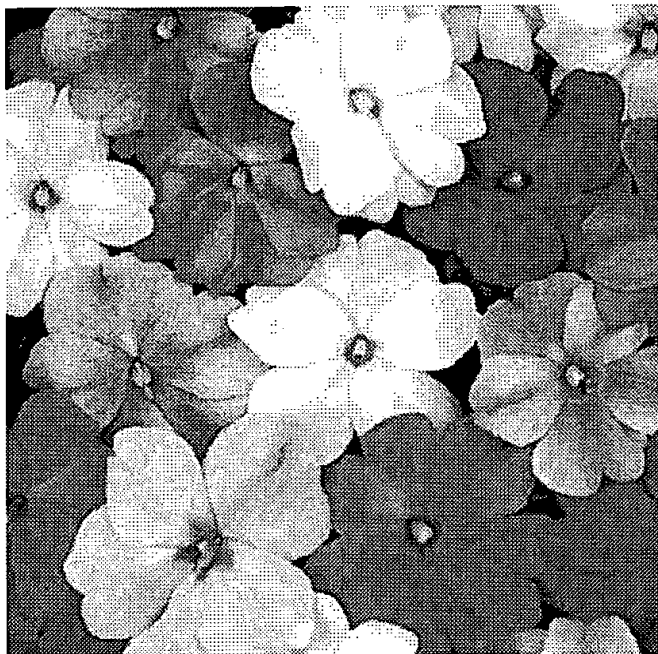
This investigation was undertaken to study the relationships between temperature duration, freezing rate, water application prior to freezing, stage of development, and frost injury to buds, flowers and fruit of pear.

Materials and Methods

Effects of freezing duration and hydration. During the spring of 1976 and 1977 spurred branches or bouquets containing at least 10 flower clusters each were collected from 41-year-old trees of 'Bartlett' pear on Old Home \times Farmingdale seedling rootstock with Old Home interstock. The basal portion of each branch was recut under water, and 3 branches were set into a vacuum flask of water to prevent supercooling of the flowers

JAVA NEW GUINEA IMPATIENS

4 New Colors & 2 New Mixes...Same Super Performance!

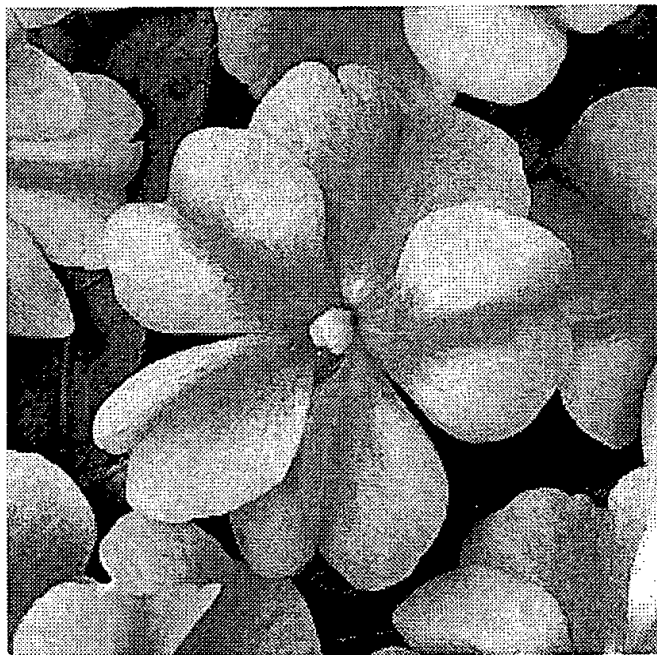


NEW Java Series New Guinea impatiens are impressing growers nationwide.

- Easy-to-grow 'Java' jumps with 85%+ Yield Potential – you'll know how many plugs will be made from the seeds you sow!
- Seed-propagated 'Java' delivers superb performance in all aspects of production.
- Quick crop time from plugs with a lower input cost than cuttings makes 'Java' profitable for the finisher.
- Growing 'Java' New Guinea impatiens from seed makes plugs compatible with mechanical transplanting.
- 'Java' has a one-week flowering window across the entire series.
- These exceptionally good performers are compact and uniform, with superior branching that produces masses of flowers.
- 'Java' is an ideal choice for production in Jumbo packs, 1801 flats and 4-in. (10-cm.) pots.
- Want to sample all eight 'Java' colors? 'Java Mix Improved' is the choice for you!
- Give 'Java' that extra sales "push" with colorful tags and benchcards. Call MasterTag at 800 253-0439 to order yours.

'JAVA' SERIES COLORS:

NEW Cherry Rose	Pearl
NEW Coral Flame	Pink
Lilac Flame	NEW White
NEW Orange	NEW Mix Improved
Orange Flame	NEW Flame Mix



Java Orange Flame New Guinea Impatiens

Java - also called Indonesia impatiens
GERMINATION
I. hawkerii also called I. platypetala

Approximate Seed Count: 17,000 S./oz. (600 S./g.)
 Seed may be germinated either on the bench or in a germination chamber.

Plug Tray Size

The recommended plug sizes for 'Java' are 400-cell (384, 392, 406) to 288-cell.

Temperature

72° to 78°F (22° to 25°C). Optimum germination temperature is 78°F (25°C).

Humidity

Maintain 100% relative humidity throughout germination. Cover seed lightly with coarse vermiculite to maintain high humidity.

Light

Light appears to improve germination.

PLUG PRODUCTION

Temperature

Keep air temperature at 70° to 75°F (21° to 24°C) and soil temperature at 70°F (21°C) from germination to transplant.

Light

Supplemental lighting is not required, but will decrease total crop time.

Fertilizer

Feed from Stage Two on with 150 ppm N complete fertilizer, 1 to 2 times per week.

Irrigation

Avoid wilting – New Guinea impatiens cannot tolerate wilt as regular impatiens can.

Plant Growth Regulators

PGRs are not needed in the plug stage for 'Java' New Guinea impatiens.

Transplanting

Plugs are ready to transplant when "pullable" from the plug tray. Do not allow plugs to get root bound.

GROWING ON TO FINISH

Container Size

'Java' New Guinea impatiens are best suited to 1801 flats, 4-in. (10-cm.) pots and Jumbo 6-packs.

Temperature

Maintain air temperature at 65° to 80°F (18° to 26°C) from transplant to sale.

Fertilizer

'Java' New Guinea impatiens are heavier feeders than vegetatively propagated varieties. If fed lightly like vegetative varieties, 'Java' will grow very slowly and not branch well. Feed plants weekly starting 10 days to 2 weeks after transplant, using 200 to 300 ppm N in a complete fertilizer. Maintain salt levels below 2.0 E.C. – make sure irrigations are thorough to prevent high salt levels.

Pinching

'Java' New Guinea impatiens have a naturally superior branching habit and do not need pinching. Pinching will only increase the crop time.

Plant Growth Regulators

Bonzi spray at a rate of 2 to 5 ppm has been tested and shown effective in the PanAmerican Seed Co. research facility in Elburn, Illinois. Apply PGRs when plants begin to touch, especially when grown pot-tight. To determine the best rate for your conditions, we recommend that you run an in-house trial.

Common Problems

No major disease problems will arise if using good cultural and IPM practices. Thrips are the most common insect pest.

Crop Scheduling

Germination:	7 to 10 days
Finish time for 406 plugs:	5 to 6 weeks
Transplant to flower:	7 to 8 weeks
Total crop time:	12 to 13 weeks

IN THE GARDEN

Home gardeners will see best results when they plant 'Java' New Guinea impatiens in a partially to fully shaded location. Space plants 10 in. (25 cm.) apart in the garden. 'Java' also works well in baskets, containers and patio planters. Water well when planted in partially shaded locations.

PanAmerican Seed

PanAmerican Seed Co.

622 Town Road

West Chicago, Illinois

U.S.A. 60185-2698

630 231-1400 Fax: 630 231-3609

©1999 PanAmerican Seed Co. Printed In USA PAS 99080 0499

STIC-ILL

SBI. H6

From: Hwu, June 1661
Sent: Thursday, May 10, 2001 7:41 AM
To: STIC-ILL
Subject: Please order the following references.

L5 ANSWER 36 OF 36 BIOSIS COPYRIGHT 2001 BIOSIS
AN 1977:100506 BIOSIS
DN BR13:100506
TI ***INTERSPECIFIC*** ***HYBRIDIZATION*** AMONG CERTAIN INDONESIAN
AND INDIAN ***IMPATIENS*** -SPP.
AU ARISUMI T
SO HortScience, (1977) 12 (4 SECT 2), 410.
CODEN: HJHSAR. ISSN: 0018-5345.
DT Conference
FS BR; OLD
LA Unavail
09473386

5 ANSWER 33 OF 36 BIOSIS COPYRIGHT 2001 BIOSIS
AN 1984:162665 BIOSIS
DN BR27:79157
TI ***INTERSPECIFIC*** ***HYBRIDIZATION*** AMONG ***IMPATIENS***
AT VARYING PLOIDY LEVELS.
AU ARISUMI T
CS FLORIST AND NURSERY CROPS LABORATORY, UNITED STATES DEPARTMENT OF
AGRICULTURE, BELTSVILLE, MD. 20705.
SO 81ST ANNUAL MEETING OF THE AMERICAN SOCIETY FOR HORTICULTURAL SCIENCE AND
THE 29TH ANNUAL MEETING OF THE CANADIAN SOCIETY FOR HORTICULTURAL SCIENCE,
VANCOUVER, B.C., CANADA, AUG. 3-9, 1984. HORTSCIENCE. (1984) 19 (3 SECT
2), 547.
CODEN: HJHSAR. ISSN: 0018-5345.
DT Conference
FS BR; OLD
LA English
09473386

L5 ANSWER 30 OF 36 BIOSIS COPYRIGHT 2001 BIOSIS
AN 1990:534362 BIOSIS
DN BR39:134860
TI IMPROVEMENT OF NEW GUINEA ***IMPATIENS*** BY ***INTERSPECIFIC***
HYBRIDIZATION
AU STEPHENS L C; FRUTH R L
CS DEP. HORTIC., IOWA STATE UNIV., AMES, IA. 50011, USA.
SO 87TH ANNUAL MEETING OF THE AMERICAN SOCIETY FOR HORTICULTURAL SCIENCE,
TUCSON, ARIZONA, USA, NOVEMBER 4-8, 1990. HORTSCIENCE. (1990) 25 (9),
1177.
CODEN: HJHSAR. ISSN: 0018-5345.
DT Conference
FS BR; OLD
LA Englis
09473386

ANSWER 27 OF 36 BIOSIS COPYRIGHT 2001 BIOSIS
AN 1995:221020 BIOSIS
DN PREV199598235320
TI Variability in water loss patterns of New Guinea ***Impatiens***
cultivars and ***breeding*** selections.
AU Strefeler, Mark S.; Quen , Robert-Jan W.

INTERSPECIFIC HYBRIDIZATION AMONG IMPATIENS AT VARYING PLOIDY LEVELS

Toru Aritsuni, Florist and Nursery Crops Laboratory, United States Department of Agriculture, Beltsville, MD 20705

Direct and reciprocal interspecific crosses among certain African and Indian *Impatiens* were made at the diploid, interloid, and tetraploid levels to determine the effects of ploidy on endosperm-embryo reaction. All of the crosses resulted in embryo abortion and fruit drop 3-4 wk before the normal harvest date. Embryo abortion was circumvented in some crosses through *in-ovo* embryo culture *in vitro*, and the rescued seedlings were grown to maturity in the greenhouse. Diploid and polyploid progenies were obtained for *I. flaccida* Arn. X *I. repens* Moen, *I. sultani* Hook 'Elfin White' X *I. auricomia* Baill., *I. sultani* 'Elfin White' X *I. niamiamensis* Gilg., and *I. guineensis* Warb. X *I. flaccida*. Comparisons between allotriploids with reversed genomic ratios, AAB vs. ABB, showed that certain phenotypes were markedly altered when the genomic ratios were reversed. Complete sterility among diploids and amphiploids indicated that the underlying causes of sterility in the hybrids were genetic as well as cytological.

203 (PS-III)

GENETICS OF SPATHE COLOR IN ANTHURIUM ANDRAEANUM ANDRÉ
Naruyuki Kamenoto*, Ruth Y. Iwata and Mari Marutani,
Department of Horticulture, University of Hawaii,
Honolulu, HI 96822.

The major spathe colors of *Anthurium andraeanum* André are red, orange, pink, coral, and white. Two major loci called M/m and O/o are responsible for these colors. Red results when both loci are dominant and at least one is homozygous (MMOO, MMoo, or MmOO). Pink results when both loci are heterozygous (MmOo). When the M locus is recessive (mm), the O locus makes the spathe either orange (mmOO), coral (mmOo), or white (mmoo). The recessive oo is epistatic to M, so the genotypes Mmoo and mmoo are also white. Thus, a cross between two pink clones (MmOo) will segregate 9 red and pink (M-O-), 3 orange and coral (mmO-), and 4 white (-oo).

BREEDING AND GENETICS: ORNAMENTALS AND TURF (204-206)

204 (PS-IV)

CHROMOSOME NUMBER AND ISOENZYME VARIATION IN FOUR KENTUCKY BLUEGRASS (*POA PRATENSIS* L.) CULTIVARS
Lin Wu* and Rachanee Jampates, Department of Environmental Horticulture, University of California, Davis, California 95616

Four Kentucky bluegrass cultivars, Baron, Fylking, Merion and Newport, were examined for chromosome number in root tip cells and esterase and phosphoglucomutase isoenzyme patterns of individual plants and cultivars. Chromosome number was found to vary in root tip cells of individual plants and cultivars. Isoenzyme patterns were found to be uniform among individual plants within a cultivar. Plants regenerated from shoot tip callus also showed chromosome number variation within plants but were uniform in isoenzyme characters. These results might be explained by either the chromosome variation in root tip cells being tissue specific or the genetic variation at the chromosome number level not being detected by electrophoretic isoenzyme analysis.

205 (PS-V)

HORTICULTURAL TAXONOMIC SIGNIFICANCE OF LEAF SURFACE MORPHOLOGY IN CULTIVATED *Cycas*
Deban, Bijan and Bart Schutzman, Department of Ornamental Horticulture, University of Florida, Gainesville, FL 32611

Cultivated species of *Cycas* L. are difficult to distinguish when immature because of extreme similarity in growth habit and leaf/leaflet morphology. Three groups are easily distinguishable: the *C. revoluta* group with short, narrow, coriaceous, dark green leaflets; the *C. circinalis* group with considerably longer, wider, more pliable, bright green leaflets; and *C. siamensis*, resembling *C. revoluta* group but deciduous and smooth-trunked. Australian taxa are

intermediate between *C. revoluta* and *C. circinalis* groups. Scanning electron microscopy (SEM) of leaflet surfaces has provided characteristics useful in distinguishing taxa as early as the seedling stage. Among these are trichome presence/absence, occurrence and topography of subsidiary and other epidermal cells, stomatal aperture shape, and stomatal frequency. These features support earlier morphological groupings but also provide additional information for species delimitation. Leaf surface evidence supports an earlier published theory of the senior author that *C. circinalis* group consists of one polymorphic species.

206 (PS-I)

BREEDING WINTER-HARDY AND REMONTANT ROSES AND WEIGELA
Felicitas Sveida, Agriculture Canada, Central Experimental Farm, Bldg. 50, Ottawa, Ontario K1A 0C6

The offspring from two consecutive generations of roses and weigela were examined for winterkill and flowering. In each genus, a progress of selection could be shown. The combination of hardiness and recurrent flowering in roses involved crosses between distantly related hybrids but not in weigela, because several cultivars of *Weigela florida* (Sieb. & Zucc.) A.DC., are relatively hardy and have a tendency for repeated flowering. So far, the efforts with roses produced ten hardy and recurrent cultivars and the efforts with weigela produced one. The flowering habit of hardy roses has been considerably improved. Champlain rose compares in flowering habit to the most floriferous floribunda cultivars but it is hardy and its excellent flowering attributes were not obtained from garden roses. This indicates that the flowering attributes of garden roses can be obtained from hybrids of different origin. The flowering habit of weigela can be improved further but it remains doubtful if weigela can be developed with the excellent flowering attributes of roses.

ENVIRONMENT AND STRESS: POMOLOGY (207-210)

207 (PS-II)

FREEZING OF WATER IN PEACH TREES

Edward Ashworth, Jeffrey Anderson*, and Glen Davis,
Appalachian Fruit Research Station, Kearneysville, WV 25430

Freezing temperatures and resident populations of ice nucleation active (INA) bacteria were determined for 'Redskin' peach shoots throughout the dormant season. No INA bacteria were detected on the majority of sampling dates (detection level = 5×10^2 cfu/g fresh wt), however the mean freezing temperature of 20 g shoots remained constant at about -2.5° C. Thermal analysis was used to determine ice nucleation temperatures of mature trees in the field. Ice formation was initiated at about -2.0° C and was observed to spread throughout the tree. The inability of woody tissues (greater than 5 g fresh wt) and intact trees to supercool appreciably was apparently due to intrinsic ice nucleators rather than large epiphytic populations of INA bacteria.

208 (PS-III)

PATHOGENIC VARIATION IN *PHYTOPHTHORA PALMIVORA* (BUTL.) BUTL.
Richard Manshardt*, Dept. of Horticulture, and Minoru Aragaki,
Dept. of Plant Pathology, U. of Hawaii, Honolulu, HI 96822

Root rot caused by *Phytophthora palmivora* is a serious disease of papaya (*Carica papaya* L.) in Hawaii. Moderately resistant papaya lines have been identified by screening inbred materials with a single isolate of the pathogen under greenhouse conditions. Differences in pathogenicity with respect to virulence and racial differentiation have not been investigated previously. Seven-week-old 'Kapoho Solo' papaya seedlings were inoculated with 5 different *P. palmivora* isolates, collected from widely separated locations within the state. Inoculum for each isolate was applied at 5 concentrations (0, 250, 750, 1500, and 3000 sporangia/plant). Seedling mortality was recorded at 10, 15, 21, and 26 days after inoculation. Regression analysis of mortality at 26 days indicated that the 5 isolates formed 3 groups that differed significantly in virulence on 'Kapoho Solo'. A second experiment, designed to examine cultivar x isolate interactions, yielded no statistically meaningful results, due to very low mortality rates. However, the results suggested that cultivar x isolate interactions are not significant, indicating that the 5 *P. palmivora* isolates tested are probably not racially differentiated.

Set	Items	Description
S1	4609	IMPATIEN?
S2	2070656	HYBRID? OR CROSS? OR BREED? OR INTERSPECIFIC
S3	2213303	HANG? OR LOW OR PROCUMBENT OR TRAILING OR BASKET
S4	87	S1 AND S2 AND S3
S5	69	RD (unique items)

?t s5/6,k/13-32

>>>KWIC option is not available in file(s): 399

5/6,K/13 (Item 11 from file: 10)

DIALOG(R)File 10:(c) format only 2001 The Dialog Corporation. All rts.
reserv.

3175098 92032410 Holding Library: AGL

***Impatiens* plant named Illusion**

1992 Feb18

***Impatiens* plant named Illusion**

A new and distinct cultivar of *Impatiens* plant named Illusion, characterized by its large, rose pink flowers with distinct carmine eye and flesh pink area outside the eye; long spur on mature...

... early blooming habit; two flower buds per leaf axil; deep red stem coloration; floriferous habit; and its ability to continuously bloom under both high and *low* temperatures and high sunlight.

DESCRIPTORS: *impatiens* - ;

Section Headings: F200 PLANT *BREEDING*; D500 LEGISLATION

5/6,K/14 (Item 12 from file: 10)

DIALOG(R)File 10:(c) format only 2001 The Dialog Corporation. All rts.
reserv.

3155145 92017149 Holding Library: AGL

***Impatiens* plant named Innocence**

1992 Feb11

***Impatiens* plant named Innocence**

A new and distinct cultivar of *Impatiens* plant named Innocence, characterized by its pure white flowers; mounded and highly self-branched habit; bright green leaves, a light reddish cast on the petioles and leaf stems; early blooming and floriferous habit; tolerance to both high and *low* temperatures and high sunlight; and its adaptability for growing in 10-25 cm pots.

DESCRIPTORS: *impatiens* - ;

Section Headings: F200 PLANT *BREEDING*; D500 LEGISLATION

5/6,K/15 (Item 13 from file: 10)

DIALOG(R)File 10:(c) format only 2001 The Dialog Corporation. All rts.
reserv.

3013309 90038638 Holding Library: AGL

***Impatiens* plant named Antares**

1990 Jun05

***Impatiens* plant named Antares**

A new and distinct cultivar of *Impatiens* plant named Antares, having deep lilac flower color, compact growth habit, dense self-branching, slightly variegated leaves, early flowering, floriferous habit, and the ability to withstand both high and *low* temperatures.

DESCRIPTORS: *impatiens*; color varieties; cultivars; patents; cuttings; container grown plants;

Section Headings: F200 PLANT *BREEDING*; D500 LEGISLATION

5/6,K/16 (Item 14 from file: 10)
DIALOG(R)File 10:(c) format only 2001 The Dialog Corporation. All rts.
reserv.

2976320 90011693 Holding Library: AGL

***Impatiens* plant named Nebulous**
1990 Jan09

***Impatiens* plant named Nebulous**

An *Impatiens* plant named Nebulous, having large, salmon orange flowers, reddish green leaves, dense branching, early flowering, good tolerance to both high and *low* temperatures, and a floriferous habit.

DESCRIPTORS: *impatiens*; color varieties; cultivars; patents; cuttings; container grown plants; heat tolerance; cold tolerance;
Section Headings: F200 PLANT *BREEDING*; D500 LEGISLATION

5/6,K/17 (Item 15 from file: 10)
DIALOG(R)File 10:(c) format only 2001 The Dialog Corporation. All rts.
reserv.

2976319 90011692 Holding Library: AGL

***Impatiens* plant named radiance**
1990 Jan09

***Impatiens* plant named radiance**

An *Impatiens* plant named Radiance, having large red flowers, excellent self-branching and floriferousness, good *trailing* habit, variegated leaves, and excellent tolerance to both high and *low* temperatures.

DESCRIPTORS: *impatiens*; color varieties; cultivars; patents; cuttings; container grown plants; variegation; heat tolerance; cold tolerance;

Section Headings: F200 PLANT *BREEDING*; D500 LEGISLATION

5/6,K/18 (Item 16 from file: 10)
DIALOG(R)File 10:(c) format only 2001 The Dialog Corporation. All rts.
reserv.

2899189 89027896 Holding Library: AGL

***Impatiens* plant named Phoebe**
1989 Apr11

***Impatiens* plant named Phoebe**

An *Impatiens* plant named Phoebe having lilac bicolored flowers with a red-purple eye and radial streaking, spreading growth habit with good branching thereby making Phoebe a good plant for *hanging* baskets, relatively late flowering, and dark red-green foliage.

DESCRIPTORS: *impatiens*; color varieties; cultivars; patents; cuttings; container grown plants;

Section Headings: F200 PLANT *BREEDING*; D500 LEGISLATION

5/6,K/19 (Item 17 from file: 10)
DIALOG(R)File 10:(c) format only 2001 The Dialog Corporation. All rts.
reserv.

2899186 89027893 Holding Library: AGL

***Impatiens* plant named Adela**
1989 Apr11

***Impatiens* plant named Adela**

An *Impatiens* plant named Adela having violet colored flowers and contrasting green foliage, early flowering, and a spreading growth habit with very good self branching thereby making Adela an excellent cultivar for *hanging* baskets.

DESCRIPTORS: *impatiens*; color varieties; cultivars; patents;
cuttings; container grown plants;
Identifiers: *hanging* *basket* plants
Section Headings: F200 PLANT *BREEDING*; D500 LEGISLATION

5/6,K/20 (Item 18 from file: 10)

DIALOG(R)File 10:(c) format only 2001 The Dialog Corporation. All rts.
reserv.

2888389 89021250 Holding Library: AGL

***Impatiends* plant named Caligo having large light pink flowers with dark pink centers, spreading growth habit which makes Caligo well suited for *hanging* which makes Caligo well suited for *hanging* baskets, and very early and profuse flowering**

1989 Mar21

***Impatiends* plant named Caligo having large light pink flowers with dark pink centers, spreading growth habit which makes Caligo well suited for *hanging* which makes Caligo well suited for *hanging* baskets, and very early and profuse flowering**

An *impatiens* plant named Caligo having large light pink flowers with dark pink centers, spreading growth habit which makes Caligo well suited for *hanging* baskets, and very early and profuse flowering.

DESCRIPTORS: *impatiens*; color varieties; cultivars; patents;
cuttings; container grown plants; flowering; earliness;
Section Headings: F200 PLANT *BREEDING*; D500 LEGISLATION

5/6,K/21 (Item 19 from file: 10)

DIALOG(R)File 10:(c) format only 2001 The Dialog Corporation. All rts.
reserv.

2888385 89021246 Holding Library: AGL

***Impatiens* plant named Isopa**

1989 Mar21

***Impatiens* plant named Isopa**

An *impatiens* plant named Isopa having bright reddish purple flowers and pleasantly contrasting dark redgreen leaves. Isopa has a spreading growth habit with very good self-branching thereby making the cultivar well suited for *hanging* baskets. Isopa flowers early and very profusely.

DESCRIPTORS: *impatiens*; color varieties; cultivars; patents;
cuttings; container grown plants; flowering; earliness;
Section Headings: F200 PLANT *BREEDING*; D500 LEGISLATION

5/6,K/22 (Item 20 from file: 10)

DIALOG(R)File 10:(c) format only 2001 The Dialog Corporation. All rts.
reserv.

2844385 88052449 Holding Library: AGL

***Impatiens* plant named Sundazzle**

1988 Sep27

***Impatiens* plant named Sundazzle**

An *Impatiens* plant named Sundazzle, having rose-red and white bicolored flowers; long broad medium green, non-variegated leaves, vigorous, compact, self-branching growth habit; floriferous habit, and having tolerance to *low* light and *low* temperature conditions.

DESCRIPTORS: *impatiens*; color varieties; cultivars; patents;
cuttings; container grown plants;
Section Headings: F200 PLANT *BREEDING*; D500 LEGISLATION

5/6,K/23 (Item 21 from file: 10)

DIALOG(R)File 10:(c) format only 2001 The Dialog Corporation. All rts.
reserv.

2838135 88048601 Holding Library: AGL

***Impatiens* plant named Equinox**
1988 Sep20

***Impatiens* plant named Equinox**

An *impatiens* plant named Equinox, having light pink flowers, with magenta eyes; dark purplish green foliage; self-branching and floriferous habit, and having the ability to tolerate both high and *low* temperatures.

DESCRIPTORS: *impatiens*; cultivars; color varieties; patents; cuttings; container grown plants;

Section Headings: F200 PLANT *BREEDING*; D500 LEGISLATION

5/6,K/24 (Item 22 from file: 10)

DIALOG(R)File 10:(c) format only 2001 The Dialog Corporation. All rts.
reserv.

2838134 88048600 Holding Library: AGL

***Impatiens* plant named Aurora**
1988 Sep20

***Impatiens* plant named Aurora**

An *impatiens* plant named Aurora, having rose pink flower color with magenta eye, variegated foliage, early flowering, two flowers per leaf axil, floriferous habit; vigorous, compact and self-branching growth habit, ease of propagation, and having the ability to flower under *low* light conditions and 70 degrees F. temperature without dropping an excessive amount of leaves.

DESCRIPTORS: *impatiens*; cultivars; color varieties; patents; container grown plants;

Section Headings: F200 PLANT *BREEDING*; D500 LEGISLATION

5/6,K/25 (Item 23 from file: 10)

DIALOG(R)File 10:(c) format only 2001 The Dialog Corporation. All rts.
reserv.

2816873 88023948 Holding Library: AGL

***Impatiens* plant named Vista Salmon and White**
1987 Mar31

***Impatiens* plant named Vista Salmon and White**

A new and distinct cultivar of *impatiens* plant named Vista Salmon and White, characterized by its very large and bright salmon-rose flowers having white eyes, profuse flowering habit, early maturing, medium...

...foliage, vigorous growth rate, excellent self-branching, and by its tall and spreading habit, making the cultivar suitable for bedding plants, pot plant culture and *hanging* baskets.

DESCRIPTORS: *impatiens*; cultivars; color varieties; patents; cuttings; container grown plants; planting stock;

Section Headings: F200 PLANT *BREEDING*; D500 LEGISLATION

5/6,K/26 (Item 24 from file: 10)

DIALOG(R)File 10:(c) format only 2001 The Dialog Corporation. All rts.
reserv.

2710836 87065991 Holding Library: AGL

***Impatiens* plant named Cirrus**
1987 Sep01

***Impatiens* plant named Cirrus**

Abstract: A new and distinct cultivar of *Impatiens* named Cirrus, particularly characterized by the combined features of relatively early flowering, white flowers with five petals in which the upper petal has a green...

... branching growth habit; green stems carrying relatively long and broad green leaves having uniform greenish yellow variegation; excellent flower keeping qualities, and ideal suitability for *hanging* baskets.

DESCRIPTORS: *impatiens*; patents; cultivars; cuttings; container grown plants;

Section Headings: F200 PLANT *BREEDING*; D500 LEGISLATION

5/6,K/27 (Item 25 from file: 10)

DIALOG(R)File 10:(c) format only 2001 The Dialog Corporation. All rts. reserv.

2274877 84020362 Holding Library: AGL

Impatiens plant (Cultivars, Gemini, bright pink flower color, floriferous habit, ideal for *basket* and bedding plants, weather resistant habits, USA)

1983

Impatiens plant (Cultivars, Gemini, bright pink flower color, floriferous habit, ideal for *basket* and bedding plants, weather resistant habits, USA)

Section Headings: F200 PLANT *BREEDING*; D500 LEGISLATION

5/6,K/28 (Item 26 from file: 10)

DIALOG(R)File 10:(c) format only 2001 The Dialog Corporation. All rts. reserv.

1770571 80122251 Holding Library: AGL

Impatiens plant--(variety) Chickasaw (Short internodes, rose-pink in summer, salmon in winter, good *basket* plant).

1978

Impatiens plant--(variety) Chickasaw (Short internodes, rose-pink in summer, salmon in winter, good *basket* plant).

Section Headings: F200 PLANT *BREEDING*; D500 LEGISLATION

5/6,K/29 (Item 1 from file: 357)

DIALOG(R)File 357:(c) 2001 Derwent Publ Ltd. All rts. reserv.

0058818 DBA Accession No.: 87-03166

Protoplast isolation from *Impatiens* walleriana- for use in
interspecific *hybridization* (conference abstract) 1986

Protoplast isolation from *Impatiens* walleriana- for use in
interspecific *hybridization* (conference abstract)

ABSTRACT: In order to create some interesting new *interspecific* *hybrids* of *Impatiens* species, procedures for protoplast isolation are being developed. Repeated trials with greenhouse and phytotron grown *Impatiens* walleriana 'Variegata' have produced only *low* yields of severely traumatized protoplasts. Several different types of enzymes and a wide range of concentrations were used. Mature axenic shoots growing on a basal B5 medium have proven to be a superior source of protoplasts. Leaf mesophyll protoplasts have been isolated from young fully expanded leaves using *low* enzyme concentrations and a short incubation. To date the protoplasts have been cultured unsuccessfully in liquid drops of Murashige and Skoog medium with 2.7...

DESCRIPTORS: protoplast isol., *Impatiens* walleriana plant propagation

5/6,K/30 (Item 1 from file: 5)
DIALOG(R)File 5:(c) 2001 BIOSIS. All rts. reserv.

12722509 BIOSIS NO.: 200000476011

Serological and molecular characterization of a high temperature-recovered virus belonging to tospovirus serogroup IV.
2000

ABSTRACT: A serologically and cytologically distinct gloxinia tospovirus (HT-1) previously isolated from a gloxinia plant infected with *Impatiens* necrotic spot virus (INSV) when propagated in a high-temperature environment was characterized. Rabbit antisera produced for INSV and Tomato spotted wilt virus (TSWV) nucleocapsids...

...with the HT-1 N protein in both ELISA and western blot analysis. DNA probes derived from the N gene of HT-1 or WSMV *hybridized* to RNAs prepared from plants infected with either virus. Stronger signals were obtained with homologous than with heterologous reactions. Neither probe detected INSV or TSWV...

...and the other in the ambisense orientation, an N protein of 277 aa. HT-1 is distantly related to INSV and TSWV as shown by *low* nucleotide (40-52%) and amino acid (28-48%) similarities in the four ORF sequences. The HT-1 virus shares high nucleotide (76-81%) and amino...

DESCRIPTORS:

ORGANISMS: *Impatiens* necrotic spot virus (Bunyaviridae (plant host only
...

5/6,K/31 (Item 2 from file: 5)
DIALOG(R)File 5:(c) 2001 BIOSIS. All rts. reserv.

11972337 BIOSIS NO.: 199900225650

Greenhouse conditioning affects landscape performance of bedding plants.
1998

...ABSTRACT: regimes using a complete water soluble fertilizer applied three times/week at 500 ppm N, designated 'high N', or at 50 ppm N, designated the '*low* N' treatment. Other treatments included: ebb and flow irrigation, drought stress for up to 2 h wilt/day, 5000 ppm B-Nine (daminozide), 45 ppm...

...daily). Unless otherwise noted all plants, including controls, were maintained well-irrigated and fertilized with 250 ppm N three times/week. Marigolds and New Guinea *impatiens* grown under *low* N during greenhouse production exhibited reduced plant height and width relative to control plants at 4 weeks after planting (WAP) in the landscape. Plant quality ratings of all species conditioned with *low* N were lower than those of controls 2 and 4 WAP. Plant height of New Guinea *impatiens* conditioned with high N was greater than that of controls 4 WAP in the landscape. Marigolds subjected to drought in the greenhouse were still shorter...

...Persistent height reductions in the landscape in response to B-Nine were observed in ageratum 2 and 4 WAP and to Bonzi in New Guinea *impatiens* through 8 WAP. Brushing reduced the height of all species except ageratum in the greenhouse, but had no carryover effect on plant growth in the landscape. At 4 weeks after treatment, plant height of columbine treated with *low* or high N, drought, brushing, or B-Nine was reduced relative to controls, but all plants were similar in size in the landscape.

DESCRIPTORS:

...ORGANISMS: Aquilegia x *hybrida* {columbine} (Ranunculaceae...

...*Impatiens* x *hybrida* {*impatiens*} (Balsaminaceae

5/6,K/32 (Item 3 from file: 5)

11698423 BIOSIS NO.: 199800480154

**Pollen fertility among BC2 offspring of *Impatiens* *interspecific*
hybrids of New Guinea and Indonesian ancestry.
1998**

**Pollen fertility among BC2 offspring of *Impatiens* *interspecific*
hybrids of New Guinea and Indonesian ancestry.**

ABSTRACT: BC2 seedlings, derived from the *cross* Tange glow (I. hawkeri Bull. X I. aurantiaca Teysm.) X 7851-1 (I. hawkeri Bull. X I. platypetala Lindl.) with 7851-1 as recurrent parent, were...

...fertility. Of 59 BC2 seedlings, 11 were capable of vitro pollen germination and also of effecting fertilization and subsequent seed set as pollen parent when *crossed* with Tange glow as the seed-parent tester. The Spearman's rank correlation coefficient (rs) of + 0.63 indicated a moderately good correlation of seedling ranking, based on pollen germination percent in vitro and seed set in vivo. Pollen germination of the 11 pollen-fertile BC2 seedlings varied from a mean *low* of 4% to a mean high of 41%. The 3 highest pollen-germinating BC2 seedlings also had the highest seed sets, but siblings showed a...

...germination for a seedling was 8% in the BC1 and 41% in the BC2. Pollen fertility in the BC2 is discussed in relation to using *interspecific* *hybridization* in an *Impatiens* *breeding* program.

DESCRIPTORS:

ORGANISMS: *Impatiens*-hawkeri x *Impatiens*-aurantiaca (Balsaminaceae...

...*Impatiens*-hawkeri x *Impatiens*-platypetala (Balsaminaceae

MISCELLANEOUS TERMS: ...*breeding*; *interspecific* *hybridization*;
?logoff

11/9/94 (Item 25 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 2001 BIOSIS. All rts. reserv.

02080388 BIOSIS NO.: 000013100506

**INTERSPECIFIC *HYBRIDIZATION* AMONG CERTAIN INDONESIAN AND *INDIAN*
IMPATIENS-SPP**

AUTHOR: ARISUMI T

JOURNAL: HORTSCIENCE 12 (4 SECT 2). 1977 410 1977

FULL JOURNAL NAME: Hortscience

CODEN: HJHSA

DOCUMENT TYPE: Meeting

RECORD TYPE: Citation

DESCRIPTORS: ABSTRACT *IMPATIENS*-BALSAMINA *IMPATIENS*-CAMPANULATA

IMPATIENS-FLACCIDA *IMPATIENS*-HOOKERIANA *IMPATIENS*-PLATYPETALA*

FERTILE SEEDLINGS

CONCEPT CODES:

03504 Genetics and Cytogenetics-Plant

53010 Horticulture-Flowers and Ornamentals

51510 Plant Physiology, Biochemistry and Biophysics-Growth,
Differentiation

51512 Plant Physiology, Biochemistry and Biophysics-Reproduction

BIOSYSTEMATIC CODES:

25620 Balsaminaceae

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA):

Plants

Vascular Plants

Spermatophytes

Angiosperms

Dicots

?t s11/full/100,99,98,85,80,67,66,64,63,61,54,48,47,27

11/9/100 (Item 31 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 2001 BIOSIS. All rts. reserv.

01267712 BIOSIS NO.: 000010007945

ON THE *BREEDING* BEHAVIOR OF THE *NEW*-GUINEA* *IMPATIENS*-SPP

AUTHOR: ARMSTRONG R J

JOURNAL: HORTSCIENCE 8 (3). 1973 269 1973

FULL JOURNAL NAME: Hortscience

CODEN: HJHSA

DOCUMENT TYPE: Meeting

RECORD TYPE: Citation

DESCRIPTORS: ABSTRACT FLOWERING

CONCEPT CODES:

03504 Genetics and Cytogenetics-Plant

51512 Plant Physiology, Biochemistry and Biophysics-Reproduction

53010 Horticulture-Flowers and Ornamentals

BIOSYSTEMATIC CODES:

25620 Balsaminaceae

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA):

Plants

Vascular Plants

Spermatophytes

Angiosperms

Dicots

11/9/99 (Item 30 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 2001 BIOSIS. All rts. reserv.

01430699 BIOSIS NO.: 000058000666

**CHROMOSOME NUMBERS AND INTERSPECIFIC *HYBRIDS* AMONG *NEW*-GUINEA*
IMPATIENS-SPP**

AUTHOR: ARISUMI T
JOURNAL: J HERED 64 (2). 1973 77-79. 1973
FULL JOURNAL NAME: Journal of Heredity
CODEN: JOHEA
RECORD TYPE: Citation
DESCRIPTORS: *IMPATIENS*-SCHLECTERI *IMPATIENS*-MOOREANA *IMPATIENS*
-LINEARIFOLIA ORNAMENTALS
CONCEPT CODES:

02504 Cytology and Cytochemistry-Plant
03504 Genetics and Cytogenetics-Plant
50526 Botany, General and Systematic-Dicotyledones
50528 Botany, General and Systematic-Floristics and Distribution
53010 Horticulture-Flowers and Ornamentals

BIOSYSTEMATIC CODES:

25620 Balsaminaceae

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA):

Plants
Vascular Plants
Spermatophytes
Angiosperms
Dicots

11/9/98 (Item 29 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 2001 BIOSIS. All rts. reserv.

01465707 BIOSIS NO.: 000058035693

***BREEDING* BEHAVIOR AND CHROMOSOME NUMBERS AMONG *NEW*-GUINEA* AND *JAVA*
IMPATIENS-SPP CULTIVATED VARIETIES AND THEIR INTERSPECIFIC *HYBRIDS***

AUTHOR: BECK A R; WEIGLE J L; KRUGER E W
JOURNAL: CAN J BOT 52 (5). 1974 923-925. 1974
FULL JOURNAL NAME: Canadian Journal of Botany
CODEN: CJBOA

RECORD TYPE: Citation

DESCRIPTORS: *IMPATIENS*-HOLSTII CHROMOSOME MORPHOLOGY PLOIDY

CONCEPT CODES:

02504 Cytology and Cytochemistry-Plant
03504 Genetics and Cytogenetics-Plant
50526 Botany, General and Systematic-Dicotyledones
50528 Botany, General and Systematic-Floristics and Distribution
51000 Morphology, Anatomy and Embryology of Plants
53010 Horticulture-Flowers and Ornamentals

BIOSYSTEMATIC CODES:

25620 Balsaminaceae

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA):

Plants
Vascular Plants
Spermatophytes
Angiosperms
Dicots

11/9/85 (Item 16 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 2001 BIOSIS. All rts. reserv.

07350548 BIOSIS NO.: 000039134860

IMPROVEMENT OF *NEW* GUINEA* IMPATIENS* BY INTERSPECIFIC HYBRIDIZATION*

AUTHOR: STEPHENS L C; FRUTH R L
AUTHOR ADDRESS: DEP. HORTIC., IOWA STATE UNIV., AMES, IA. 50011, USA.
JOURNAL: 87TH ANNUAL MEETING OF THE AMERICAN SOCIETY FOR HORTICULTURAL
SCIENCE, TUCSON, ARIZONA, USA, NOVEMBER 4-8, 1990. HORTSCIENCE 25 (9).
1990. 1177. 1990

CODEN: HJHSA

DOCUMENT TYPE: Meeting

RECORD TYPE: Citation

LANGUAGE: ENGLISH

DESCRIPTORS: ABSTRACT *IMPATIENS*--*HAWKERI* *IMPATIENS*--*PLATYPETALA*
IMPATIENS--AURANTIACA PLANT HEAT TOLERANCE STERILITY *BREEDING* CROP
INDUSTRY AGRICULTURE

CONCEPT CODES:

03504 Genetics and Cytogenetics-Plant
10618 External Effects-Temperature as a Primary Variable-Hot (1971-)
51503 Plant Physiology, Biochemistry and Biophysics-Temperature
51512 Plant Physiology, Biochemistry and Biophysics-Reproduction
53010 Horticulture-Flowers and Ornamentals
00520 General Biology-Symposia, Transactions and Proceedings of
Conferences, Congresses, Review Annuals

BIOSYSTEMATIC CODES:

25620 Balsaminaceae

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA):

Plants
Vascular Plants
Spermatophytes
Angiosperms
Dicots

11/9/80 (Item 11 from file: 5)

DIALOG(R)File 5:Biosis Previews(R)

(c) 2001 BIOSIS. All rts. reserv.

08665127 BIOSIS NO.: 199345083202

Inheritance of qualitative traits in *New* *Guinea* *impatiens*.

AUTHOR: Ouene Robert-Jan W; Strefeler Mark S

AUTHOR ADDRESS: Univ. Minn., Dep. Horticultural Sci., 305 Alderman Hall,
1970 Folwell Ave., St. Paul, MN 55108**USA

JOURNAL: Hortscience 28 (5):p190-191 1993

CONFERENCE/MEETING: 90th Annual Meeting of the American Society for
Horticultural Science Nashville, Tennessee, USA July 24-29, 1993

ISSN: 0018-5345

RECORD TYPE: Citation

LANGUAGE: English

DESCRIPTORS:

MAJOR CONCEPTS: Genetics; Horticulture (Agriculture); Morphology

BIOSYSTEMATIC NAMES: Balsaminaceae--Dicotyledones, Angiospermae,

Spermatophyta, Plantae; Plantae-Unspecified--Plantae

ORGANISMS: plant (Plantae - Unspecified); Balsaminaceae (Balsaminaceae)

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA): angiosperms; dicots; plants;
spermatophytes; vascular plants

INDUSTRY: crop industry

MISCELLANEOUS TERMS: ABSTRACT; AGRICULTURE; *BREEDING*; FLOWER COLOR;

FLOWER SIZE; HERITABILITY; LEAF COLOR; VARIEGATION

CONCEPT CODES:

03504 Genetics and Cytogenetics-Plant
51000 Morphology, Anatomy and Embryology of Plants
53010 Horticulture-Flowers and Ornamentals
00520 General Biology-Symposia, Transactions and Proceedings of
Conferences, Congresses, Review Annuals
51510 Plant Physiology, Biochemistry and Biophysics-Growth,
Differentiation
51512 Plant Physiology, Biochemistry and Biophysics-Reproduction

BIOSYSTEMATIC CODES:

25620 Balsaminaceae

11/9/67 (Item 40 from file: 10)

DIALOG(R)File 10:AGRICOLA

(c) format only 2001 The Dialog Corporation. All rts. reserv.

427682 739186712

Chromosome numbers and interspecific *hybrids* among *New* *Guinea*
Impatiens species

Arisumi, T

J Hered Mar/Apr 1973 64 (2): 77-79.

LC: 442.8 AM3

Language: English

Document Type: ARTICLE

Section Headings: 4025 Plant Genetics and *Breeding* (1972-79)

11/9/66 (Item 39 from file: 10)

DIALOG(R)File 10:AGRICOLA

(c) format only 2001 The Dialog Corporation. All rts. reserv.

551257 749059532

Breeding behavior and chromosome numbers among *New* *Guinea* and
Java *Impatiens* species, cultivated varieties, and their interspecific
hybrids

Beck, A R; Weigle, J L; Kruger, E W

Can J Bot May 1974 52 (5): 923-925.

LC: 470 C16C

Language: English

Document Type: ARTICLE

Section Headings: 4025 Plant Genetics and *Breeding* (1972-79)

11/9/64 (Item 37 from file: 10)

DIALOG(R)File 10:AGRICOLA

(c) format only 2001 The Dialog Corporation. All rts. reserv.

597638 749098513

Chromosome numbers and *breeding* behavior of *hybrids* among Celebes,
Java, and *New* *Guinea* species of *Impatiens* L

Arisumi, T

Hortsci Oct 1974 9 (5): 478-479.

LC: SB1.H6

Language: English

Document Type: ARTICLE

Indonesia

Section Headings: 4025 Plant Genetics and *Breeding* (1972-79)

11/9/63 (Item 36 from file: 10)

DIALOG(R)File 10:AGRICOLA

(c) format only 2001 The Dialog Corporation. All rts. reserv.

719387 759086575

Phenotypic analysis of progenies of artificial and natural amphiploid
cultivars of *New* *Guinea* and Indonesian species of *Impatiens* L. [
Breeding]

Arisumi, T

J Am Soc Hortic Sci July 1975 100 (4): 381-383.

LC: 81 S012

Language: English

Document Type: ARTICLE

Section Headings: 4025 Plant Genetics and *Breeding* (1972-79)

11/9/61 (Item 34 from file: 10)

DIALOG(R)File 10:AGRICOLA

(c) format only 2001 The Dialog Corporation. All rts. reserv.

935647 779042286

Introduction and *breeding* of the *New* *Guinea* *Impatiens* [in the
United States]

Armstrong, R J

Bull Am Assoc Bot Gard Arboreta Apr 1976 10 (2): 36-38.
LC: QK1.A45
Language: English
Subfile: OTHER US;
Document Type: ARTICLE
United States
Section Headings: 4025 Plant Genetics and *Breeding* (1972-79)

11/9/54 (Item 27 from file: 10)
DIALOG(R)File 10:AGRICOLA
(c) format only 2001 The Dialog Corporation. All rts. reserv.

1675996 80039623 Holding Library: AGL
Chromosome numbers and comparative *breeding* behavior of certain
Impatiens from Africa, India, and *New* *Guinea*
Arisumi, T.
AR-BARC
Mount Vernon, Va., , The Society.
Journal of the American Society for Horticultural Science.American
Society for Horticultural Science. v. 105 (1) , Jan 1980. p. 99-102.
ill.
ISSN: 0003-1062
NAL: 81 S012
Language: ENGLISH
12 ref.
Subfile: OTHER US (NOT EXP STN, EXT, USDA; SINCE 12/76);
Document Type: ARTICLE
Geographic Location: Africa; India; *New* *Guinea*
Section Headings: F200 PLANT *BREEDING*

11/9/48 (Item 21 from file: 10)
DIALOG(R)File 10:AGRICOLA
(c) format only 2001 The Dialog Corporation. All rts. reserv.

2718922 87071371 Holding Library: AGL
In vitro pollen germination and viability of a *Java* X *New* *Guinea*
Impatiens interspecific *hybrid*
Hicks, C.B. Stephens, L.C.; Weigle, J.L.
Ottawa, Ont. : National Research Council of Canada.
Canadian journal of botany = Journal canadien de botanique. Sept 1987. v.
65 (9) p. 1967-1968.
ISSN: 0008-4026 CODEN: CJBOAW
DNAL CALL NO: 470 C16C
Language: English Summary Language: French
Includes references.
Subfile: OTHER FOREIGN;
Document Type: Article
DESCRIPTORS: *impatiens*; interspecific *hybridization*; in vitro;
pollen germination; pollen viability;
Section Headings: F200 PLANT *BREEDING*

11/9/47 (Item 20 from file: 10)
DIALOG(R)File 10:AGRICOLA
(c) format only 2001 The Dialog Corporation. All rts. reserv.

2727891 87078965 Holding Library: AGL
Cytology and morphology of ovule culture-derived interspecific
Impatiens *hybrids*
Arisumi, T.
Alexandria, Va. : The Society.
Journal of the American Society for Horticultural Science. Nov 1987. v.
112 (6) p. 1026-1031.
ISSN: 0003-1062 CODEN: JOSHB

DNAL CALL NO: 81 SO12
Language: English
Includes list of species from Africa, India, *New* *Guinea*, and
Indonesia.
Includes references.
Subfile: OTHER US (NOT EXP STN, EXT, USDA; SINCE 12/76);
Document Type: Article
DESCRIPTORS: *impatiens*; interspecific *hybridization*; ovule culture
; cytology; plant morphology;
Section Headings: F200 PLANT *BREEDING*; F400 PLANT STRUCTURE AND
CYTOLOGY

11/9/27 (Item 27 from file: 203)
DIALOG(R)File 203:AGRI
Dist by NAL, Intl Copr. All rights reserved. All rts. reserv.

00265583 AGRIS No: 80-560691
**Pollen fertility in *Java* x *New* *Guinea* *Impatiens* interspecific
hybrids [herbaceous ornamentals]**
Pasutti, D.W. (Iowa State University, Ames, IA 50011 (USA)); Weigle,
J.L.
Journal: Canadian Journal of Botany, 1980, v. 58(3) p. 384-387
Notes: 12 ref., 1 fig.
Language: English Summary Language: French
Place of Publication: Canada
Document Type: Journal Article, Summary
Journal Announcement: 0610 Record input by Canada
Descriptors: Herbaceous ornamentals - other; Pollen
Section Headings: F60 (PLANT PRODUCTION -- Plant physiology and
biochemistry)

Set	Items	Description
S1	4588	IMPATIEN?
S2	120424	HAWKERI OR (NEW (W) GUINEA) OR INDIAN?
S3	54618	JAVA OR INDONESIA OR (NEW (W) GUINEA) OR PLATYPETAL?
S4	301	S1 AND S2
S5	298	S1 AND S3
S6	271	S4 AND S5
S7	192	RD (unique items)
S8	2046508	INTERSPECIFIC OR HYBRID? OR CROSS? OR BRED OR BREED?
S9	146	S6 AND S8
S10	103	S8 AND S7
S11	102	RD (unique items)

?t s11/6,k/100,99,98,94,85,80,67,66,64,63,61,54,48,47,27

>>>KWIC option is not available in file(s): 399

SYSTEM:OS - DIALOG OneSearch

File 203:AGRIS 1974-2001/Nov

Dist by NAL, Intl Copr. All rights reserved

File 10:AGRICOLA 70-2001/May

(c) format only 2001 The Dialog Corporation

File 357:Derwent Biotechnology Abs 1982-2001/Jun B1

(c) 2001 Derwent Publ Ltd

***File 357: Price changes as of 1/1/01. Please see HELP RATES 357.**

File 5:Biosis Previews(R) 1969-2001/May W3

(c) 2001 BIOSIS

File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec

(c) 1998 Inst for Sci Info

File 34:SciSearch(R) Cited Ref Sci 1990-2001/May W4

(c) 2001 Inst for Sci Info

File 399:CA SEARCH(R) 1967-2001/UD=13421

(c) 2001 AMERICAN CHEMICAL SOCIETY

***File 399: Use is subject to the terms of your user/c**